

~~DRAFT~~IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Bozidar Ferek-Petric

Examiner: F.P. Oropeza

Serial No.: 10/085,047

Group Art Unit: 3762

Filed: 1 March 2002

Docket: P-8158.03 DIV2

Title: ISCHEMIC HEART DISEASE DETECTION

DECLARATION UNDER 37 CFR 1.131 ANTEDATING A REFERENCE

I hereby declare the following:

- 1) I am currently and correctly named as an inventor in the pending patent application entitled ISCHEMIC HEART DISEASE DETECTION, Serial number 10/085,047.
- 2) The invention disclosed within the above-referenced patent application was conceived of by me and the other named inventors prior to August 1998.
- 3) A written description of the invention is present in certain invention disclosure form and related documents of mine with a date of entry prior to August 1998, a copy of which is appended hereto as EXHIBIT A.
- 4) An Invention Disclosure Form was completed that described the invention and was submitted to the Medtronic, Inc. legal department for consideration prior to August 1998.
- 5) The invention was not publicly disclosed or offered for sale prior to the filing date of the present patent application.
- 6) I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and

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further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: \_\_\_\_\_

**DRAFT** \*

Bozidar Ferek-Petric

**Medtronic**

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Medtronic Inc.  
Attn: The Director, Patent Liaison  
Pacing Business Unit  
7000 Central Avenue N.E.  
Minneapolis, MN 55432-3576

**IDEA SUBMITTAL AGREEMENT**  
**Extension of the P-8131**

Gentlemen,

Please receive and evaluate my disclosure (attached) of an Idea ("Idea" includes Ideas, confidential information, patent applications and completed inventions) for:

**Myocardial Infarction Detection Utilizing Coronary Sinus Flow Measurement**

under the following conditions:

**INVENTORSHIP**

I am the originator or am rightfully representing the originator of this Idea, am of legal age and have the right to disclose this Idea to the Medtronic Inc.

**PURPOSE**

I am disclosing my Idea to allow Medtronic to evaluate my Idea as they deem appropriate and determine their interest in negotiating for any rights therein. I understand my Idea may be disclosed to those employees or consultants of Medtronic obligated to treat this information in confidence.

**CONFIDENTIALITY**

Medtronic considers itself to be a member of the general public for the purpose of receiving the disclosure of the Idea. For a period of time ending twelve (12) months from the date this Agreement is signed, Medtronic will exercise the same degree of care to maintain in confidence the Idea as they exercise to protect their own confidential information. Medtronic will not,

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however, be obligated under this Agreement with respect to any Idea or part thereof which:

- a. is publicly available as of the date Medtronic receives your disclosure or becomes publicly available through no fault of Medtronic;
  - b. is released or published by me in writing (e.g. by publication of articles or patent applications);
  - c. is obtained from third parties who did not directly or indirectly receive the information from me;
  - d. is previously known to or is subsequently developed by Medtronic independently of my disclosure; or
  - e. is inadvertently disclosed by a Medtronic employee who has no direct or indirect knowledge of my disclosure under this Agreement.

**PERIOD**

After the twelve (12) month period ends, Medtronic shall not have any express or implied obligation to me or liability for their disclosure, use or non-use of this Idea, and any related or unrelated Ideas I disclose to them in the course of its evaluation, whether use commences before or after the twelve (12) month period ends except as may arise independently of this Agreement, under valid patents I may obtain on inventions contained in the disclosed Idea.

## LAWs

This Agreement shall be governed by the laws of The Netherlands and there are no additional understandings, agreements or representations expressed or implied which are not specified herein.

Yours sincerely,

Bordolao, Jesus P. July 6th, 1938.  
(Signature) (Date)

Božidar Ferček-Petrić  
Sovince 17  
10000 Zagreb  
Croatia

**PROBLEM:**

The most common dangerous development of the ischemic heart disease is the myocardial infarction. It usually develops suddenly due to the occlusion of the coronary artery by a thrombus and only emergency treatment can save the patient. The first interventional method of treatment is delivery of the thrombolytic drug dissolving the thrombus. The next choice is the percutaneous coronary angioplasty by means of the balloon catheter. Finally, surgical treatment by the aorto-coronary bypass is the final solution. Nevertheless, the prompt diagnosis and the fast therapy start are the most important for survival of the patient, whereby the minutes measured time may be critical. Accordingly, some means for fast detection of impending myocardial infarction would be very important.

**SOLUTION:**

An implantable device comprising an ECG analysis means as well as a coronary flow measurement means capable to recognize the impending myocardial infarction can either give an alarm to the patient or even to deliver the proper drugs therapy. An implantable device comprises a sensor measuring the blood flow velocity either in cardiac vein or coronary sinus. A computer within the implantable device calculates the integral of the blood flow waveform being proportional to the blood flow volume and stores the data developing the long-term trend diagram of the blood flow volume in the memory. Physician may evaluate the ischemic heart disease progression by means of interrogating the device by a programmer and displaying the blood flow trend. It is known from cardiac physiology that coronary arteries deliver the oxygenated blood to the cardiac muscle and that the venous blood exits the cardiac muscle through the coronary sinus. Eventual disturbance of the blood flow through the coronary sinus will be the consequence of the circulatory problem within the certain coronary artery i.e. any occlusion of the coronary artery will decrease the blood volume flowing into the cardiac muscle and consequently decrease the blood volume flowing out of the cardiac muscle. Accordingly, decrease of the blood flow volume will occur in the major acute myocardial infarction. The myocardial infarction causes also the S-T elevation within the ECG waveform. The computer of the implantable device continuously monitors the S-T segment of the ECG waveform and also collects the data for the S-T segment trend developing the long-term trend diagram of the S-T segment. Physician may evaluate the long-term S-T segment variations by means of interrogating the device by a programmer and displaying the S-T trend diagram. If suddenly either of trend curves, blood flow or S-T, shows its derivation increase

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evaluate if positive or negative derivation occurred in both or in  
only one trend curve. If the negative derivation increase occurs in blood flow trend  
curve together with the positive derivation increase in S-T segment trend curve, that  
means that a myocardial infarction develops. Accordingly, implantable device will  
give an alarm to the patient. It may be an audible alarm or some muscle stimulating  
alarm as it was described in prior art. Implantable device may also have a drug  
delivery pump and a catheter, and it may start the thrombolytic therapy as well as a  
prophylactic arrhythmia therapy.

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### MI detection point



